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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/594,614

09/28/2006

Nobuo Asahara

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KUBOVCIK & KUBOVCIK
SUITE 1105
1215 SOUTH CLARK STREET
ARLINGTON, VA 22202

EXAMINER

TORRES VELAZQUEZ, NORCA LIZ

ART UNIT

PAPER NUMBER

1794

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/594,614	Applicant(s) ASAHARA ET AL.	
	Examiner Norca L. Torres-Velazquez	Art Unit 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 January 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,6,7 and 9-31 is/are pending in the application.
- 4a) Of the above claim(s) 20-31 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,6,7 and 9-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 September 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12309</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. The amendment and remarks filed on January 22, 2009 have been entered and considered herein. No new matter was found. Claims 20-31 remain withdrawn. Claims 1-3, 6-7 and 9-19 remain active.

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. **Claims 1-3, 6-7 and 11-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over NISHIMURA et al. (US 4,786,541) in view of FAIRBANKS (US 6,106,646) and LORENZ et al. (US 2002/0053400 A1).**

NISHIMURA et al. relates to a reinforcing fiber material used in fiber reinforced plastics (FRP) that are useful for skin materials of an airplane wing or H- or I-beams. It discloses a fiber material for reinforcing plastics prepared by laminating at least one first fiber substrate in which the reinforcing fibers extend in two directions. (Abstract; Refer to Col. 8, lines 63-68) The reference discloses an embodiment in which a reinforcing fiber material is constructed by laminating a plurality of substrates and integrating these by stitch yarns. The reference teaches the use of unidirectional prepreps that are prepared by gathering by impregnating longitudinally arranged reinforcing fibers with an uncured thermosetting resin. The reference also teaches the use of unidirectional woven fabrics, and that these can also be used impregnated with a resin. (Refer to Col. 4, lines 22-57) The woven fabrics can have a plain weave, or other weaves such as satin and twill. (Refer to Col. 5, lines 10-12) The reference teaches the use of multifilament

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yarns such as carbon fibers, and polyaramide fiber, among others, as the reinforcing fibers. (Col. 5, lines 36-39) The reference teaches the use of resin such as unsaturated polyester resin, epoxy resin, phenol resin and polyimide resins for the impregnation of the reinforcing fibers material. With regards to the resin of the material, it is noted that the reference teaches that the content based on the reinforcing fiber material is preferably 35 to 60% by volume. Further, discloses that the resin content will vary depending on the geometrical space confined by the fiber substrates and the reinforcing fibers. (Refer to Col. 7, lines 46-55 and Col. 8, lines 3-26) The reference further teaches that a needle having the least possible cross-sectional area, a sharp point and a smooth surface is preferred. (Col. 8, lines 50-55) The reference further teaches that with respect to the thickness of the stitch yarns, it is preferred that the cross-sectional area is 0.01 to 0.025 mm². [*equivalent to a diameter of 0.112-0.564*] (Refer to Col. 6, lines 63-65) It is the Examiner's interpretation that the holes holding the stitch yarns will have at least a diameter between 0.112-0.564 mm.

It is the Examiner's position that the resin used for the impregnation of the reinforcing fibers material of NISHIMURA will inherently provide for the interlaminated resin material between layers of the reinforcing fiber substrates in the perform claimed in the present invention, since the surfaces of the impregnated layers will contain resin. However, the Examiner provides herein the prior art of LORENZ et al. to provide motivation to further provide polymer layers between the reinforcing layers.

LORENZ et al. relates to a method for producing preforms from fiber composite semi-finished products. [0002] The reference teaches using polymer layers alternatively stacked with cut dry fiber composite semi-finished product sections to ensure that the individual semi-finished

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product layers bond with each other. The reference further teaches that if necessary, it is feasible to provide local recesses in the polymer coating for the forming process. In this way, the molding properties of the bonded fabric and/or the perform that is supposed to be produced can be controlled specifically, because the dry fiber composite semi-finished products can shift in these areas due to the friction sliding resistance predetermined by the material. (Refer to Abstract, [0022] and [0028])

While NISHIMURA et al. teaches needling the layers and this process could be interpreted to provide the claimed holes, the Examiner provides herein the reference of FAIRBANKS to show that the presence of holes in the material of NISHIMURA et al. would be obvious.

FAIRBANKS discloses a method for joining a plurality of layers of no fully cured composite material, including layers comprising a fiber reinforced polymeric matrix. The reference teaches a plurality of spaced apart holes generated through the stacked layers by penetrating a thin, pointed tool into and through a preform using ultrasonic energy applied to the tool. The hole wall is smooth and fiber reinforcement is substantially is undisturbed away from the hole wall. (Refer to Abstract; Col. 2, lines 1-12; col. 3 lines 8-20)

Since the references are directed to fiber reinforced plastics, the purpose disclosed by LORENZ et al. and FAIRBANKS would have been recognized in the pertinent art of NISHIMURA et al.

Thus, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the material of NISHIMURA et al. and provide it with through holes formed by the method disclosed by FAIRBANKS with the motivation of producing holes

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that have smooth hole walls in which the fiber reinforcement is substantially undisturbed that minimizes the effect on the fiber reinforcement in the matrix allowing for stitching in the Z direction without weakening the “Z” axis stitching as disclosed by FAIRBANKS. (Refer to Col. 1, lines 37-55; and Col. 2, lines 1-12) Also, it would have been obvious to one having ordinary skill in the art to use polymer layers interlaminated between the reinforcing substrates motivated by the desire of ensuring that the individual semi-finished product layers bond with each other as taught by LORENZ et al. (above) A reference may be understood by the artisan as suggesting a solution to a problem that the reference does not discuss. See KSR, 137 S. Ct. at 1742, 82 USPQ2d at 1397 “Common sense teaches... that familiar items may have obvious uses beyond their primary purposes, and in any cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle. ... A person of ordinary skill is also a person of ordinary creativity, not an automaton.”).

With regards to the claimed stepped portion with a different stacking number of reinforcing fiber substrates, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide additional reinforcement to certain areas of a preform depending on the strength requirements and design of a of a final product, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8. Such construction can also be seen in the LORENZ et al. reference. (Refer to drawings)

4. Claims 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over NISHIMURA et al., LORENZ et al. and FAIRBANKS as applied above, and further in view of WADAHARA et al. (US 2004/0170554 A1).

NISHIMURA et al. fails to disclose the form of the resin.

WADAHARA et al. also relates to fiber reinforced substrates and preform comprising the substrate. [0001] The reference teaches the use of resins in the form of fabric, particles, discontinuous pieces. [0170]

Therefore, it would have been obvious to one having ordinary skill in the art of fiber reinforced plastics to use resin materials in the form of particle or fiber fabric motivated by the desire of providing homogeneity, mechanical property improving effect and inhibition of water absorption to the composite as taught by WADAHARA et al. [00170]

Response to Arguments

5. Applicant's arguments with respect to claims 1-3, 6-7 and 9-19 have been considered but are moot in view of the new ground(s) of rejection.

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Norca L. Torres-Velazquez whose telephone number is 571-272-1484. The examiner can normally be reached on Monday-Thursday 8:00-5:00 pm and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Larry Tarazano can be reached on 571-272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Norca L. Torres-Velazquez/
Primary Examiner, Art Unit 1794

May 7, 2009